Having thus described the preferred embodiments, the invention is now claimed to be:

1. An image segmentation process, comprising the following step:

a) segmenting an image into a main background, a local background, and a first object, wherein the first object is on either the main background or the local background.

2. The process set forth in claim 1, step a) further comprising the following steps:

b) identifying a main background for the image;

c) segmenting a first object on the main background;

d) classifying the first object into one class of a group of classes consisting of a text object, a picture object, and a composite object;

e) if the first object is classified as a composite object, identifying a local background for the first object;

f) segmenting a next object on the local background;

g) classifying the next object into one class of a group of classes consisting of a text object, a picture object, and a composite object; and

h) if the next object is classified as a composite object, performing steps e) through g) for the next object.

3. The process set forth in claim 2, step b) further comprising the following steps:

i) identifying one or more block of pixels in the image, wherein the dynamic ranges of each of the three color channels are less than a predetermined threshold for the block;

j) applying a region growing algorithm to each uniform block, wherein adjacent pixels with a color difference from the uniform block less than a predetermined threshold are marked as belonging to the region;

k) calculating a mean color for each grown region;

l) combining regions of similar mean color; and

m) identifying the region with the largest bounding area as the main background for the image.

4. The process set forth in claim 2, step c) further comprising the following steps:

i) detecting edges in the main background in both vertical and horizontal directions;

j) removing the edge pixels from the main background;

k) identifying a non-text object on the main background using a connect component analysis; and

l) segmenting the non-text object on the main background.

5. The process set forth in claim 2, wherein the first object is classified as a composite object, step e) further comprising the following steps:

i) detecting edges in the first object;

j) removing the edge pixels from the first object;

k) applying a region growing algorithm to each pixel on the outer boundary of the removed edge pixels, wherein adjacent pixels with a color difference from the region less than a predetermined threshold are marked as belonging to the region; and

l) identifying the region with the largest bounding area;

m) comparing the dimensions of the largest region to a predetermined threshold; and

n) if the dimensions of the largest region are greater than the predetermined threshold, identifying the region as the local background for the first object, otherwise, reclassifying the first object as a picture object.

6. The process set forth in claim 2, steps f) and g) further comprising the following steps:

i) applying a one-dimensional morphological algorithm to the local background in the horizontal direction to segment the next object and classifying the next object as a text object if the width of the elements detected by the algorithm is less

than a maximal width; and

j) applying a one-dimensional morphological algorithm to the local background in the vertical direction to segment the next object and classifying the next object as a text object if the width of the elements detected by the algorithm is less than a maximal width.

7. The process set forth in claim 2, step f) further comprising the following steps:

i) detecting edges in the local background in both vertical and horizontal directions;

j) removing the edge pixels from the local background; and

k) segmenting the object on the local background using a connect component analysis.

8. An image segmentation process, comprising the following steps:

a) performing low-resolution segmentation of an image into a main background, a local background, and a first object, wherein the first object is on either the main background or the local background; and

b) refining the borders shared by any two of the main background, the local background, and the first object at the original resolution of the image.

9. The process set forth in claim 8, step a) further comprising the following steps:

c) low-pass filtering and decimating the image;

d) identifying a main background for the image;

e) segmenting a first object on the main background;

f) classifying the first object into one class of a group of classes consisting of a text object, a picture object, and a composite object;

g) if the first object is classified as a composite object, identifying a local background for the first object;

h) segmenting an next object on the local background;

i) classifying the next object into one class of a group of classes

consisting of a text object, a picture object, and a composite object; and

j) if the next object is classified as a composite object, performing steps g) through i) for the next object.

10. The process set forth in claim 9, steps e) and f) further comprising the following steps:

k) applying a one-dimensional morphological algorithm to the main background in the horizontal direction to segment the first object and classifying the first object as a text object if the width of the elements detected by the algorithm is less than a maximal width; and

l) applying a one-dimensional morphological algorithm to the main background in the vertical direction to segment the first object and classifying the first object as a text object if the width of the elements detected by the algorithm is less than a maximal width.

11. The process set forth in claim 9, step b) further comprising the following steps:

m) interpolating the low-resolution segmentation results on the original resolution of the image;

n) if any local background is segmented and if any object is classified as a picture object, refining the borders of each local background and each picture object; and

o) if any object is classified as a text object, refining the borders and interior of each text object.

12. The process set forth in claim 11, step n) further comprising the following steps:

p) applying a region growing algorithm to each of the pixels along the borders of each local background and each picture object, wherein adjacent pixels with a color difference from the region less than a predetermined threshold are marked as belonging to the region

13. The process set forth in claim 11, step o) further comprising the following steps:

p) applying a region growing algorithm to each pixel along the border of each text object, wherein adjacent pixels with a color difference from the region less than a predetermined threshold are marked as belonging to the region; and

q) applying a region growing algorithm to each pixel of each text object, wherein adjacent pixels with a color difference from the region less than a predetermined threshold are marked as belonging to the region.

14. The process set forth in claim 11, further comprising the following steps:

p) determining if the local background is a sweep; and

q) if the local background is a sweep, reclassifying the composite object as a picture object.

15. The process set forth in claim 14, step p) further comprising the following steps:

r) dividing the local background into 16 sub-regions, wherein the sub-regions are in a 4 x 4 arrangement;

s) computing the mean color of each sub-region;

t) determining the maximal difference between the mean colors;

u) comparing the maximal difference to a predetermined threshold; and

v) if the maximal difference is larger than the predetermined threshold, identifying the local background as a sweep.

16. A method for segmenting an image, comprising the following steps:

a) identifying a main background for the image;

b) identifying a first object on the main background;

c) classifying the first object into one class of a group of classes consisting of a text object, a picture object, and a composite object; and

d) if the first object is classified as a composite object, identifying a local

background for the first object.

17. The method set forth in claim 16, further comprising the following steps:

e) if the first object is classified as a composite object, identifying a second object on the local background of the first object;

f) classifying the second object into one class of a group of classes consisting of a text object, a picture object, and a composite object; and

g) if the second object is classified as a composite object, identifying a local background for the second object.

18. The method set forth in claim 17, further comprising the following steps:

h) if the second object is classified as a composite object, identifying a third object on the local background of the second object;

i) classifying the third object into one class of a group of classes consisting of a text object, a picture object, and a composite object; and

j) if the third object is classified as a composite object, identifying a local background for the third object.

19. The method set forth in claim 16, further comprising the following steps:

e) identifying a second object on the main background;

f) classifying the second object into one class of a group of classes consisting of a text object, a picture object, and a composite object; and

g) if the second object is classified as a composite object, identifying a local background for the second object.

20. The method set forth in claim 19, further comprising the following steps:

h) if the second object is classified as a composite object, identifying a third object on the local background of the second object;

i) classifying the third object into one class of a group of classes consisting of a text object, a picture object, and a composite object; and

j) if the third object is classified as a composite object, identifying a local background for the third object.

21. The method set forth in claim 16, further comprising the following steps:

e) if the first object is classified as a composite object, determining if the dimensions of the local background of the first object are greater than a predetermined threshold; and

f) if the dimensions are not greater than the predetermined threshold, reclassifying the first object as a picture object.

22. The method set forth in claim 16, further comprising the following steps:

e) if the first object is classified as a composite object, determining if the local background of the first object is a sweep; and

f) if the local background of the first object is a sweep, reclassifying the first object as a picture object.